MODULE HANDBOOK DESCRIPTION

Module designation	Power System Analysis II	
Code	FBA3208	
Semester(s) in which the module is taught	6/third year	
Person responsible for the module	Dr. Rosmaliati , S.T., M.T	
Language	Indonesian	
Relation to curriculum	Elective for electrical power systems engineering student	
Teaching methods	Lecture, small group discussion, case base method.	
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester : • Lectures: 2 x 50 minutes • Exercises and Assignments: 2 x 60 minutes • Private study: 2 x 60 minutes. Total study hours = 5 hours 40 minutes/week	
Credit points	*2 (~ 3.2 ECTS)*	
Required and recommended prerequisites for joining the module	- Power System Analysis I (FBS3101)	
Module objectives/intended learning outcomes	1. Students are able to draw impedance diagrams. 2. Students are able to analyze balanced three-phase faults and can determine the capacity of a circuit breaker. 3. Students are able to analyze asymmetrical faults 4. Students are able to analyze the stability of the power system. 5. Students are able to analyze the symmetrical components and create sequence networks.	PLO3
	1. Students are able to simulate balanced three-phase faults. 2. Students are able to simulate asymmetrical faults 3. Students are able to simulate the stability of the power system.	PLO4

	1. Students are able to evaluate balanced three-phase faults. 2. Students are able to evaluate asymmetrical faults. 3. Students are able to evaluate the stability of the power system.	PLO5
Content	1. Bus Admittance and Impedance Matrices 2. Thevenin theorem and Zbus 3. Modification of the Existing Zbus. 4. Direct Determine of Zbus. 5. Calculation of Zbus Elements from Ybus. 6. Power Invariant Transformation. 7. Mutually Coupled Branches in Zbus. 8. Transients in Series RL Circuits. 9. Internal Voltage of Loaded Synchronous Machine Under Fault Condition. 10. Fault Calculation Using Zbus. 11. Fault Calculation Using Zbus Equivalent Circuit. 12. Selection of Circuit Breakers. 13. Series Sequences of the Synchronous Machines. 14. Circuit Sequence of a YΔ Transformer. 15. Unsymmetric Series Impedance. 16. Sequence Network. 17. Unsymmetric Faults in the Power System. 18. Single Line to Ground Faults. 19. Line to Line Fault. 20. Double line to Ground Faults. 21. Open Conductor faults. 22. Power System Stability. 23. Equation of Swing and Rotor Dynamics. 24. Power Angle Equation. 25. Synchronization Power Coefficient. 26. Equal Area Criterion of Stability.	
Examination forms	- Calculation Test and Essay, - Presentation case study - Asignment	
Study and examination requirements	The final grade in the module is composed of: a. Per-meeting score = 5 % x 14 meeting = 70% b. Exercise Report/ Homework/Portfolio = 30% Students must have a final grade of 65% or higher to pass	

Reading list	1. Grainger, J.J., dan Stevenson W.D.Jr., 1994, ”Power Sistem Analysis”, McGraw-Hill, Inc., Singapore. 2. Saadat, H., 1999, “Power System Analysis”, McGraw-Hill, Singapore. 3. Gonen, Turan. Modern power system analysis. CRC Press, 2013.